

AMENDMENTS TO CLAIMS

1. (Currently Amended) A system for inserting a medical device into a patient, the system including an imaging device scanning the patient to generate a volumetric image data set of the patient, a human readable device for displaying an image of the patient derived from said volumetric image data set, means for selecting a virtual trajectory defining a path for inserting the medical device into said patient, robotic means on said imaging device and movable into selected positions relative to the imaging device, and a guide apparatus disposed on the robotic means to direct movement of the medical device relative to the patient-disposed on the robotic means, the guide apparatus comprising:

a connector portion coupling the guide apparatus with the associated imaging device at a distal end of the robotic means, and comprising a linear slider mechanism which restricts movement of the guide apparatus to a single linear path;

a main body portion supported relative to the associated imaging device by the connector portion;

a gripping area formed at a first end of the main body portion, the gripping area adapting the guide apparatus for manual gripping by an associated operator; and,

a holding area formed at a second end of the main body portion, the holding area holding the medical device in an orientation suitable for motion relative to said patient along a selected linear path, the holding-area guide apparatus being operative to translate the medical device along said selected linear path in response to manual force applied by the associated human operator at said gripping area during insertion of the medical device as restricted by the linear slider mechanism.

2. (Previously Presented) The system according to claim 1, wherein the imaging device is a CT scanner, an MRI scanner, a CCT scanner, a fluoroscope, a SPECT scanner, a PET scanner, or a combination of the foregoing.

3. (Previously Presented) The system according to claim 1, wherein the medical device is an ablation probe or a biopsy needle.

4. (Previously Presented) The system according to claim 1, wherein said means for selecting said virtual trajectory includes means for selecting a virtual target point in said image of the

patient by identifying a first coordinate in said image of the patient, and means for identifying a virtual path extending from said selected virtual target point and the body of the patient.

5. (Previously Presented) The system according to claim 1, wherein said robotic means is adapted to move said guide apparatus into a position whereat said medical device is in an orientation suitable for motion relative to said patient along said selected linear path coincident with said virtual path extending from said virtual target point and the body of the patient.

6. (Currently Amended) The system according to claim 1, wherein said connector portion of the guide apparatus includes the linear slider mechanism comprises a one of a linear slide joint and a prism joint.

7. (Previously Presented) The system according to claim 1, further including:

a position feedback device provided on said connector portion of the guide apparatus for providing a feedback signal indicating a position of the guide apparatus relative to the patient; and,

means for displaying an image of the medical device as it is physically moved relative to the patient based upon said feedback signal, together with said image of the patient and said virtual path.

8. (Previously Presented) The system according to claim 1, wherein the holding area is formed of an x-ray transmissive material.

9. (Previously Presented) The system according to claim 1, wherein the holding area includes a set of tweezers-like arm portions adapted to grip the medical device in a V-shaped groove formed by the arm portions.

10. (Currently Amended) A method of inserting a medical device into a patient, the method comprising:

providing an imaging device scanning the patient to generate a volumetric image data set of the patient;

providing a human readable device for displaying an image of the patient derived from said volumetric image data set;

providing means for selecting a virtual trajectory defining a path for inserting the medical device into said patient;

providing robotic means on said imaging device and movable into selected positions relative to the imaging device;

providing a guide apparatus to direct movement of the medical device relative to the patient disposed on the robotic means, the guide apparatus including a connector portion coupling the guide apparatus with the associated imaging device at a distal end of the robotic means and comprising a linear slider mechanism which restricts movement of the guide apparatus to a single linear path; a main body portion supported relative to the associated imaging device by the connector portion; a gripping area formed at a first end of the main body portion, the gripping area adapting the guide apparatus for manual gripping by an associated operator; and, a holding area formed at a second end of the main body portion, the holding area holding the medical device in an orientation suitable for motion relative to said patient along a selected linear path, the holding-area guide apparatus being operative to translate the medical device along said selected linear path in response to manual force applied by the associated human operator at said gripping area during insertion of the medical device as restricted by the linear slider mechanism; and,

inserting the medical device into the patient by manually urging the guide apparatus towards said patient.

11. (Previously Presented) The method according to claim 10, wherein providing the imaging device includes providing a CT scanner, an MRI scanner, a CCT scanner, a fluoroscope, a SPECT scanner, a PET scanner, or a combination of the foregoing.

12. (Previously Presented) The method according to claim 10, wherein the medical device is an ablation probe or a biopsy needle.

13. (Previously Presented) The method according to claim 10,

wherein said means for selecting said virtual trajectory further comprises means for selecting a virtual target point in said image of the patient by identifying a first coordinate in said image of the patient, and means for identifying a virtual path extending from said selected virtual target point and the body of the patient, and

the method further comprises moving the medical device and the guide apparatus while performing said scanning of the patient.

14. (Previously Presented) The method according to claim 10, further including using said robotic means to move said guide apparatus into a position whereat said medical device is in an orientation suitable for motion relative to said patient along said selected linear path coincident with said virtual path extending from said virtual target point and the body of the patient.

15. (Currently Amended) The method according to claim 10, wherein ~~said connector portion of the guide apparatus includes the linear slider mechanism comprises~~ at least one of a linear slide joint and a prism joint.

16. (Previously Presented) The method according to claim 10, further including:

providing a position feedback device on said connector portion of the guide apparatus for generating a feedback signal indicating a position of the guide apparatus relative to the patient; and,

displaying an image of the medical device as it is physically moved relative to the patient based upon said feedback signal, together with said image of the patient and said virtual path.

17. (Previously Presented) The method according to claim 10, including forming the holding area of an x-ray transmissive material.

18. (Previously Presented) The method according to claim 10, wherein the holding area includes a set of tweezers-like arm portions adapted to grip the medical device in a V-shaped groove formed by the arm portions.

19. (Currently Amended) A guide apparatus for assisting in medical procedures, the guide apparatus comprising:

a connector portion coupling the guide apparatus with an imaging device and comprising a linear slider mechanism which restricts movement of the guide apparatus to a single linear path;

a main body portion supported relative to the imaging device by the connector portion;

a gripping area formed at a first end of the main body portion, the gripping area adapting the guide apparatus for manual gripping by an operator; and,

a holding area formed at a second end of the main body portion, the holding area holding a medical device in an orientation suitable for motion relative to a patient along a selected linear path, the holding-area guide apparatus being operative to translate [a] the medical device along

said selected linear path in response to manual force applied by the operator at said gripping area during an insertion of the medical device as restricted by the linear slider mechanism.

20. (Previously Presented) The guide apparatus of claim 19, wherein the holding area includes a set of tweezers-like arm portions for gripping the medical device in a V-shaped groove formed by the arm portions.